WHAT IS CLAIMED IS:

1. A method for measuring optical tissues of an eye, the method comprising:

transmitting an image through the optical tissues;

determining local gradients across the optical tissues from the transmitted image; and

mapping an error-correcting change in the optical tissues by integrating across the gradients.

2. The method of claim 1, wherein the image is transmitted from the retina anteriorly through the optical tissues.

3. The method of claim 2, further comprising transmitting a source image from a light source posteriorly through the optical tissues and onto the retina to define the image.

4. The method of claim 3, wherein the image comprises a small spot or point.

5. The method of claim 3, wherein the image is transmitted posteriorly through a central region of the cornea, the central region having a size which is significantly less than a pupil size of the eye.

6. The method of claim 5, wherein the central region has a width of between about 1 and 4 mm.

7. The method of claim 2, wherein the mapping step comprises deriving a proposed change in the optical tissue surface elevations so as to effect a desired change in optical properties of the eye, and further comprising modifying the optical tissue surface according to the proposed change by laser ablation.

8. The method of claim 1, wherein the image is transmitted by the optical tissues as a plurality of beamlets, wherein the gradients comprise an array of gradients, each gradient corresponding to an associated portion of an optical surface, each beamlet being transmitted through the optical tissue according to the corresponding gradient.

9. The method of claim 8, wherein the integrating step comprises integrating along a closed integration path across the gradient array.

10. The method of claim 9, further comprising determining an accuracy of the gradient array by calculating a change in elevation along the closed integration path.

11. The method of claim 9, wherein the closed integration path extends from a first center of a first portion of the optical surface to a second center of a second portion of the optical surface, from the second center to a third center of a third portion of the optical surface, and from the third center back to the first center, the first, second and third portions of the optical surface corresponding to the first, second and third gradients of the gradient array, respectively.

12. The method of claim 9, wherein the closed integration path extends from an initial location corresponding to a position between a first gradient array element and a second gradient array element, the path crossing a first portion of the optical surface corresponding to the second gradient array element, a second portion of the optical surface corresponding to a third gradient array element, and a third portion of the optical surface corresponding to a fourth gradient array element before returning back to the initial location.

13. The method of claim 1, further comprising adjusting the image with an adaptive optical element so as to compensate for errors of the optical system.

14. The method of claim 1, wherein an elevation map of an optical surface of the optical system is generated directly in the mapping step without deriving coefficients of a series expansion mathematically approximating the optical surface.

15. A method for measuring optical tissues of an eye, the method comprising:

transmitting an image through the optical tissue;

determining local gradients across the optical tissue from the transmitted image; and

mapping a wavefront error of the eye by integrating the gradients across the tissue.

16. The method of claim 15, wherein the step of integrating further comprises:

integrating along a closed integration path across a gradient array.

17. The method of claim 16, further comprising determining an accuracy of the gradient array by calculating a change in elevation along the closed integration path.

18. A method of determining an accuracy of a gradient array in an optical tissue measurement comprising:

transmitting an image through the optical tissue;

determining local gradients across the optical tissue from the transmitted image; and

integrating along a closed integration path across a portion of the array.

19. The method of claim 18, further comprising:

calculating a change in elevation along the closed integration path across the portion of the array.

20. The method of claim 18 wherein, the closed integration path comprises:

a common starting point, a common ending point, a first integration path connecting the common starting point to the common ending point, and a second integration path connecting the common starting point to the common ending point, the first and second integration paths being different.

21. A system for diagnosing an eye of a patient, the eye having a retina and optical tissues, the system comprising:

an image source arranged to direct an image posteriorly through the optical tissues and onto the retina;

a wavefront sensor oriented to sense the image as transmitted anteriorly by the optical tissue, the wavefront sensor generating signals indicating gradients across the optical tissues; and

a processor having an integration module configured for integrating among the gradients to determine a map for correction of the optical tissues.

22. The system of claim 21, wherein the processor directly determines a surface elevation map of an optical surface without generating coefficients of a series expansion mathematically approximating the surface.

23. The system of claim 21, wherein the processor comprises a computer executable code performing the method of claim 15 or 18.

24. A method of measuring a tomographic wavefront error map of an eye, the method comprising:

deflecting a light measurement path of a wavefront sensor to a first angular orientation relative to the eye;

measuring the eye at the first angular orientation;

deflecting the light measurement path to a second angular orientation;

measuring the eye at the second angular orientation; and

calculating the tomographic wavefront error map of the eye from the sequential measurements, the map comprising a plurality of localized optical tissue surfaces of the eye at different depths of the eye.

25. The method of claim 24 wherein a first optical tissue surface is measured at the first angular orientation and a second optical tissue surface is measured at the second angular orientation, and further comprising:

forming a light structure having a feature on a retina of the eye; and

repeating the steps of measuring and deflecting to obtain a plurality of sequential optical tissue surface measurements..

26. The method of claim 25 further comprising displacing a position of the light structure from a first position to a second position so that a feature of the light structure in the second position is resolvable from the feature of the light structure in the first position.

27. A method of selecting an aberration of an eye for treatment comprising:

calculating a tomographic wavefront error map of an eye comprising a plurality of localized optical tissues surfaces of the eye;

corresponding the aberration with a tissue structure of the eye;

selecting the aberration for treatment in response to the structure corresponding to the aberration; and

combining a plurality of aberrations selected for treatment to obtain an optical treatment surface.

28. The method of claim 27 further comprising including the aberration corresponding to a corneal tissue structure of an eye and excluding the aberration corresponding to a lenticular tissue structure of an eye.

29. The method of claim 27, wherein the plurality of aberrations selected for treatment is a subset of a plurality of aberrations of the eye.

30. A method of selectively treating an aberration in an optical tissue surface of an eye comprising:

corresponding the aberration with a tissue structure of the eye;

selecting the aberration for treatment in response to the structure corresponding to the aberration;

combining a plurality of aberrations selected for treatment to obtain an optical treatment surface; and

sculpting a cornea of the eye with a pattern of laser beam pulses to correct for the selected aberrations of the optical treatment surface.

31. The method of claim 30 further comprising including the aberration corresponding to a corneal tissue structure of an eye and excluding the aberration corresponding to a lenticular tissue structure of the eye.

32. A method of measuring a wavefront map of an eye comprising:

deflecting a light measurement path of a wavefront sensor to a first angular orientation relative to the eye;

measuring a first optical tissue surface of the eye at the first angular orientation of the measurement path relative to the eye;

deflecting the light measurement path to a second angular orientation;

measuring a second optical tissue surface at the second angular orientation; and

calculating the wavefront error map of the eye from the sequential optical tissue surface measurements.

33. The method of claim 32 further comprising repeating the steps of deflecting and measuring to obtain a plurality of optical tissue surface measurements.

34. The method of claim 33 further comprising:

forming a light structure having a feature on the retina; and

displacing a position of the light structure from a first position to a second position so that a feature of the light structure in the second position is resolvable from the feature of the light structure in the first position.

35. A machine-readable code comprising instructions for effecting the method recited in claims 24, 27, 30, or 32.